



Improving Research Mentoring Relationships in Support of Researcher Mental Health & Work-Life Integration Post-COVID

DOE Laboratories of the Future Series

Melissa McDaniels
Co-Investigator, Inclusive Graduate Education Network
Associate Executive Director
Center for the Improvement of Mentored Experiences in Research
University of Wisconsin-Madison

Center for the Improvement of Mentored Experiences in Research (CIMER)



Wisconsin Center for Education Research
SCHOOL OF EDUCATION | UNIVERSITY OF WISCONSIN-MADISON

CIMER Mission

Improve the research mentoring relationships for mentees and mentors at all career stages and disciplines through the development, implementation, and study of evidence-based and culturally-responsive interventions.



Assumptions

- Mentoring is not the *only* factor in researcher success but it is a *major determinant* in the likelihood of career success & well-being.
- Mental health and well-being have challenged the research workforce long before COVID; COVID has exacerbated these issues.
- Systemic inequities and barriers have affected the career trajectories and well being of minoritized researchers long before COVID; COVID has amplified these disparities.
- My remarks and recommendations have implications for individuals, leaders and policy makers.
- DOE National Labs are diverse institutions, some operated by industrial entities others by universities and non-for-profit organizations.

The Science of Effective Mentorship in STEMM



#NASEMmentoring

CONSENSUS STUDY REPORT

MENTAL HEALTH, SUBSTANCE USE, and WELLBEING in HIGHER EDUCATION

Supporting the Whole Student

research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention
graduate · staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersection
identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersection
substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medic
schools · integrated support · research · mental health · community college · students · data · substance use
undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools
integrated support · research · mental health · community college · students · data · substance use · undergraduate
faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support
research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention
graduate · staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
Undergrad

Recommendations

1. Use a shared definition of mentorship
2. Leverage the research on the relationship between strong mentoring relationships and positive mentee outcomes
3. Engage in evidence-based research mentorship education
4. Access resources for further learning



Center for the Improvement of
Mentored Experiences in Research

Recommendation #1:

Use a Shared Definition of Mentorship



Recommendation #1: Use a shared definition of mentorship.

*Mentorship is a professional, **working alliance** in which individuals work together over time to support the personal and professional growth, development, and success of the **relational partners** through the provision of career and psychosocial support.*

Mentorship includes **career support functions** (e.g., career guidance, skill development, sponsorship) and **psychosocial support functions** (e.g., emotional support or role modeling) aimed at mentee talent development.

Distinguish between mentorship and titles/roles

- Research supervisor
- Technical manager
- Formally assigned career mentor
- Peers

Anyone in any role can engage in research mentoring



Center for the Improvement of
Mentored Experiences in Research

Recommendation #2:

Leverage the Research on Mentorship



The Science of Effective Mentorship in STEMM



#NASEMmentoring

CONSENSUS STUDY REPORT

MENTAL HEALTH, SUBSTANCE USE, and WELLBEING in HIGHER EDUCATION

Supporting the Whole Student

research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention
graduate · staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersection
identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersection
substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medic
schools · integrated support · research · mental health · community college · students · data · substance use
undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools
integrated support · research · mental health · community college · students · data · substance use · undergraduate
faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support
research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention
graduate · staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate
staff · intersectional identities · medical schools · integrated support · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment
Undergrad · research · mental health · community college · students · data · substance use · undergraduate · faculty · wellbeing · prevention · graduate · staff · intersectional identities · medical schools · integrated support · research · ment

Mentoring Matters

- **Enhanced science identity, sense of belonging and self efficacy** (Palepu *et al*, 1998; Garman *et al*, 2001; Paglis *et al*, 2006; Lopatto, 2007; Bland *et al*, 2009; Feldman *et al*, 2010; Cho *et al*, 2011; Chemers *et al*, 2011; Thiry & Laursen, 2011; Byars-Winston *et al.*, 2015; Estrada *et al.*, 2018)
- **Persistence** (Gloria *et al*, 2001; Solorzano 1993; McGee and Keller, 2007; Sambunjak *et al*, 2010; ; Bordes-Edgar *et al.*, 2011; Campbell & Campbell, 1997; Hernandez *et al.*, 2017)
- **Research productivity** (Steiner and Lanphear, 2002; 2007; Wingard *et al*, 2004)

Mentoring Matters

- **Higher career satisfaction** (Schapira *et al*, 1992; Beech *et al*, 2013; Dandar, Field & Garrison, 2017; Zimmerman *et al* 2020)
- **Mentee mental health and well-being** (good mentorship as a protective factor) (National Academies of Sciences, Engineering, and Medicine. 2021.)

Attributes of Effective Mentoring Relationships

RESEARCH SKILLS

- Guide mastery of research skills
- Guide acquisition of knowledge
- Accurately assess if mentees' understand disciplinary knowledge and skills
- Valuing and practicing ethical behavior and responsible conduct of research

INTERPERSONAL SKILLS

- Listening actively
- Aligning mentor and mentee expectations
- Building trusting relationships/ honesty

PSYCHOSOCIAL SKILLS

- Providing motivation
- Developing mentee career self-efficacy
- Developing mentee research self-efficacy
- Developing science identity
- Developing a sense of belonging

DIVERSITY/CULTURALLY-FOCUSED SKILLS

- Advancing equity and inclusion
- Being culturally responsive
- Reducing the impact of bias
- Reducing the impact of stereotype threat

SPONSORSHIP SKILLS

- Fostering mentees' independence
- Promoting professional development
- Establishing and fostering mentee professional networks
- Actively advocating on behalf of mentees

ALIGNED WITH DEVELOPMENTAL STAGE

- Knowing when to support and when to challenge
- Anticipating change over time
- Evolving the relationship



Mentoring Quality & Well-Being

- Good mentorship practices (in general) serve as a protective factor for researcher mental health (NASEM, 2020)
 - Enacting aforementioned attributes will be beneficial in general
- Research mentors can engage in practices that have been shown to directly attend to mental well-being of researchers:
 - Recognize issues and warning signs
 - Empathize
 - Make referrals

Effective Mentorship is a Learned Skill

[Acad Med.](#) Author manuscript; available in PMC 2014 Aug 5.

PMCID: PMC4121731

Published in final edited form as:

NIHMSID: NIHMS613869

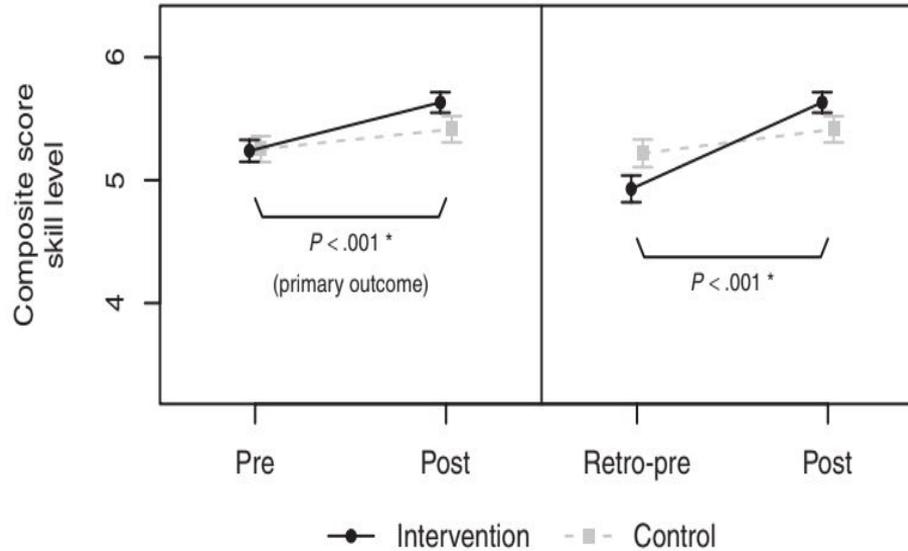
[Acad Med.](#) 2014 May; 89(5): 774–782.

PMID: [24667509](#)

doi: [10.1097/ACM.0000000000000218](#)

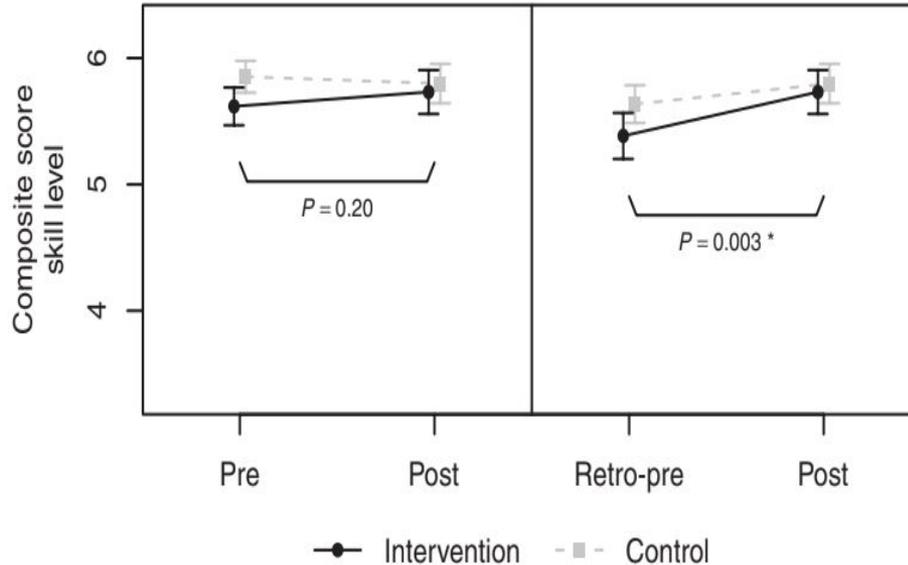
Training Mentors of Clinical and Translational Research Scholars: A Randomized Controlled Trial

[Christine Pfund](#), PhD, [Stephanie C. House](#), MA, [Pamela Asquith](#), PhD, [Michael F. Fleming](#), MD, [Kevin A. Buhr](#), PhD, [Ellen L. Burnham](#), MD, MSc, [Julie M. Eichenberger Gilmore](#), PhD, [W. Charles Huskins](#), MD, MSc, [Richard McGee](#), PhD, [Kathryn Schurr](#), MS, [Eugene D. Shapiro](#), MD, [Kimberly C. Spencer](#), and [Christine A. Sorkness](#), PharmD



Skill level: 1 = not at all skilled 4 = moderately skilled 7 = extremely skilled

Figure 2 Comparisons by group of mean Mentoring Competency Assessment composite score self-assessed by mentors with changes shown from pretest ("Pre") to posttest ("Post") and from retrospective pretest ("Retro-pre") to posttest ("Post"). Group means with 95% confidence intervals are shown. *P* values test for group difference in the indicated change.



Skill level: 1 = not at all skilled 4 = moderately skilled 7 = extremely skilled

Figure 4 Comparisons by group of mean Mentoring Competency Assessment composite score assessed by mentees with changes shown from pretest ("Pre") to posttest ("Post") and from retrospective pretest ("Retro-pre") to posttest ("Post"). Group means with 95% confidence intervals are shown. *P* values test for group difference in the indicated change.

Recognizing and responding to cultural identities contributes to mentorship effectiveness

- Mentoring addressing cultural diversity matters and psychosocial needs of diverse students is positively correlated with their science identity, commitment to a research career, and satisfaction with a research career (Fresquez & Haeger, 2016)
- Mentorship can ameliorate negative effects of students' feelings of being "othered" due to their non-science identities in STEMM by increasing inclusion and psychosocial support



Center for the Improvement of
Mentored Experiences in Research

Recommendation #3:

Engage in Evidence-Based Mentorship Education



Engage in evidence-based research mentorship education

- Evidence-based approach developed by scholars and thought leaders at the University of Wisconsin
- Standardized competencies and validated assessments



Aligning Expectations	Assessing Understanding
Promoting Professional Development	Addressing Equity & Inclusion
Maintaining Effective Communication	Cultivating Ethical Behavior
Fostering Independence	Promoting Research Self-Efficacy
Cultivating Work Life Integration	Fostering Wellness & Wellbeing

[Acad Med.](#) Author manuscript; available in PMC 2014 Aug 5.

PMCID: PMC4121731

Published in final edited form as:

NIHMSID: NIHMS613869

[Acad Med.](#) 2014 May; 89(5): 774–782.

PMID: [24667509](#)

doi: [10.1097/ACM.0000000000000218](#)

Training Mentors of Clinical and Translational Research Scholars: A Randomized Controlled Trial

[Christine Pfund](#), PhD, [Stephanie C. House](#), MA, [Pamela Asquith](#), PhD, [Michael F. Fleming](#), MD, [Kevin A. Buhr](#), PhD, [Ellen L. Burnham](#), MD, MSc, [Julie M. Eichenberger Gilmore](#), PhD, [W. Charles Huskins](#), MD, MSc, [Richard McGee](#), PhD, [Kathryn Schurr](#), MS, [Eugene D. Shapiro](#), MD, [Kimberly C. Spencer](#), and [Christine A. Sorkness](#), PharmD



[J Clin Transl Sci](#). 2019 Dec; 3(6): 302–307.

Published online 2019 Oct 15. doi: [10.1017/cts.2019.408](https://doi.org/10.1017/cts.2019.408)

PMCID: PMC6886003

PMID: [31827903](https://pubmed.ncbi.nlm.nih.gov/31827903/)

The role of mentors in addressing issues of work–life integration in an academic research environment

[Dennis R. Durbin](#),^{1,2} [Stephanie C. House](#),³ [Emma A. Meagher](#),⁴ and [Jenna Griebel Rogers](#)³

▶ [Author information](#) ▶ [Article notes](#) ▶ [Copyright and License information](#) ▶ [Disclaimer](#)



Engage in evidence-based research mentorship education (continued)

- Adapted for different career stages (mentors of faculty, graduate students, postdocs, undergraduates)
- Adapted for different disciplines and institutional types
- Developed over the last decade with funding from National Science Foundation, Howard Hughes Medical Institute, National Institutes of Health
- All open access



Center for the Improvement of
Mentored Experiences in Research

Recommendation #4:

Access Resources for Future Learning





IGEN Goals:

- Increase the fraction of students from underrepresented groups who complete physical science doctoral degrees
- Catalyze the adoption of evidence-based inclusive practices in graduate education
- Establish sustained, cross-sector partnerships that support the advancement of underrepresented students

Mentorship Training Curriculum Project Goal. To adapt an existing evidence-based mentor training curriculum primarily focused on mentorship in the university context to one that is salient to the National Laboratory context

Project History. In Fall 2019 we gathered the directors of postdoctoral offices from across (primarily) department of energy national laboratories to describe the project aims. As a result of that meeting, four individuals from three laboratories volunteered to join a development team.

Department of Energy National Laboratories



Mentorship Education for Scientists at Federally-Funded Research Centers (National Laboratories)

Part of the
W.H. Freeman Entering Mentoring Series



Jet Propulsion Laboratory
California Institute of Technology



www.cimerproject.org



Center for the Improvement of
Mentored Experiences in Research

[About](#) ▾ [Training Services](#) ▾ [Curricula](#) ▾ [For Facilitators](#) ▾ [Assessment Platform](#) ▾ [Research](#) ▾ [Portal](#)

SEARCH



CIMER: Providing resources for organizations and institutions to improve research mentoring relationships

Be Intentional About Transitions

CBE—Life Sciences Education, Vol. 20, No. 1 | General Essays and Articles

 Free Access

Reassess—Realign—Reimagine: A Guide for Mentors Pivoting to Remote Research Mentoring

Christine Pfund , Janet L. Branchaw, Melissa McDaniels, Angela Byars-Winston, Steven P. Lee,, and Bruce Birren
Derek Braun, Monitoring Editor

Published Online: 26 Feb 2021 | <https://doi.org/10.1187/cbe.20-07-0147>

- Plan in-person interactions
- Reassess goals
- Realign Expectations
- Identify short, medium and long term goals
- Attend to psychosocial needs
- Lead by example

nature

[Explore content](#) [Journal information](#) [Publish with us](#) [Subscribe](#)

[nature](#) > [career column](#) > [article](#)

CAREER COLUMN | 11 June 2021

Six mentoring tips as we enter year two of COVID

As the world recovers, students will need help to get back on track, say Ruth Gotian and Christine Pfund.

[Ruth Gotian & Christine Pfund](#)



2019 NASEM Report

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

THE SCIENCE OF EFFECTIVE MENTORSHIP IN STEMM ONLINE GUIDE V1.0



Overview ▾

Mentorship Defined ▾

Program Development and Management ▾

Actions and Tools ▾

Rationale

Why Mentorship Matters

About the Report

Recommendations

Mentorship Functions

Forms of Mentorship

Mentorship, Identity, and
STEMM

Culturally Responsive
Mentorship

Negative Mentoring
Experiences

Mentorship Education

Matching Mentors and
Mentees

Program Assessment

Developing a Culture of
Mentorship

Mentoring Tools

References

✉ Comments or Suggestions?

📄 www.nap.edu/mentoring

Where can you learn more?

Read the Report

www.nap.edu/MentorshipInSTEMM

Use the Online Guide

www.nationalacademies.org/MentorshipInSTEMM

Learn about the Project

www.nas.edu/mentoring

Join the Conversation

#NASEMmentoring

Ask a Question or Make a Comment

mentoring@nas.edu

DOE Laboratories of the Future Series
June 29, 2021

**Improving Research Mentoring Relationships
in Support of Researcher Mental Health & Work-Life Integration
Post-COVID**

Resources & Workshop Documents

Further Interest Form

- Please fill out this form if you want to learn more about mentorship education in the National Labs
<https://forms.gle/42xQKJiVB8Ew79fd8>

Resources shared in workshop:

- National Academies Report on Mentorship
 - Full Report: www.nap.edu/MentorshipInSTEMM
 - Online Guide: www.nap.edu/MentorshipInSTEMM